

## *Analyzing Personal Expenses*

### 1. Introduction

Managing personal finances is essential for maintaining financial stability and making informed spending decisions. This project, "Analyzing Personal Expenses," is designed to track and analyze monthly expenses using Python, MySQL, and Streamlit. The project provides users with insights into their spending habits by categorizing expenses, identifying patterns, and visualizing key metrics.

### 2. Project Workflow

The project consists of four key components:

#### 1. Synthetic Expense Data Generation:

- A Python script (`expense_project.py`) creates realistic synthetic expense data using the Faker library.
- Each transaction is assigned a category, description, payment mode, and amount and stored in a CSV file (`expenses_data.csv`).

#### 2. Database and Table Creation

- Before inserting expense data, a MySQL database and table were created using MySQL Workbench. The following SQL commands were executed to set up the database and table.

Step 1: Create Database:

```
CREATE DATABASE expense_tracker;
```

Step 2: Create Table:

```
USE expense_tracker;
```

```
CREATE TABLE expenses (
```

```
    id INT AUTO_INCREMENT PRIMARY KEY,
```

```
    date DATE,
```

```
    category VARCHAR(255),
```

```
    payment_mode VARCHAR(255),
```

```
    description TEXT,
```

```
    amount FLOAT,
```

```
    cashback FLOAT
```

```
);
```

- This table is designed to store detailed expense records, including:  
Date – When the expense occurred.  
Category – Classification (e.g., Food, Rent, Shopping).  
Payment Mode – How the expense was paid (Cash, Credit Card, UPI, etc.).  
Description – Additional details about the transaction.  
Amount – The total transaction amount.  
Cashback – Any cashback received from the transaction.

The AUTO\_INCREMENT primary key ensures each transaction has a unique ID.

### 3. Database Integration:

- A second Python script (mysqlconnector.py) reads the CSV file and inserts the data into a MySQL database (expense\_tracker).

### 4. Streamlit Dashboard for Analysis:

- A Streamlit-based interactive dashboard fetches data from MySQL and presents it in visual form using Plotly and Streamlit widgets.
- Users can analyze spending trends, category-wise expenses, payment methods, cashback insights, and recurring expenses.

## 3. Technologies Used

- Python (for data generation, database handling, and dashboard development)
- Faker (for generating synthetic expense data)
- MySQL (for storing and retrieving expense records)
- Streamlit (for interactive data visualization)
- Plotly (for creating dynamic charts and graphs)

## 4. Using the Streamlit Dashboard

### Step 1: Install Required Dependencies

Ensure you have all necessary Python libraries installed:

```
pip install streamlit pandas mysql-connector-python plotly faker
```

### Step 2: Run the Streamlit Dashboard

Run the dashboard script using:

```
python -m streamlit run expense_streamlit.py
```

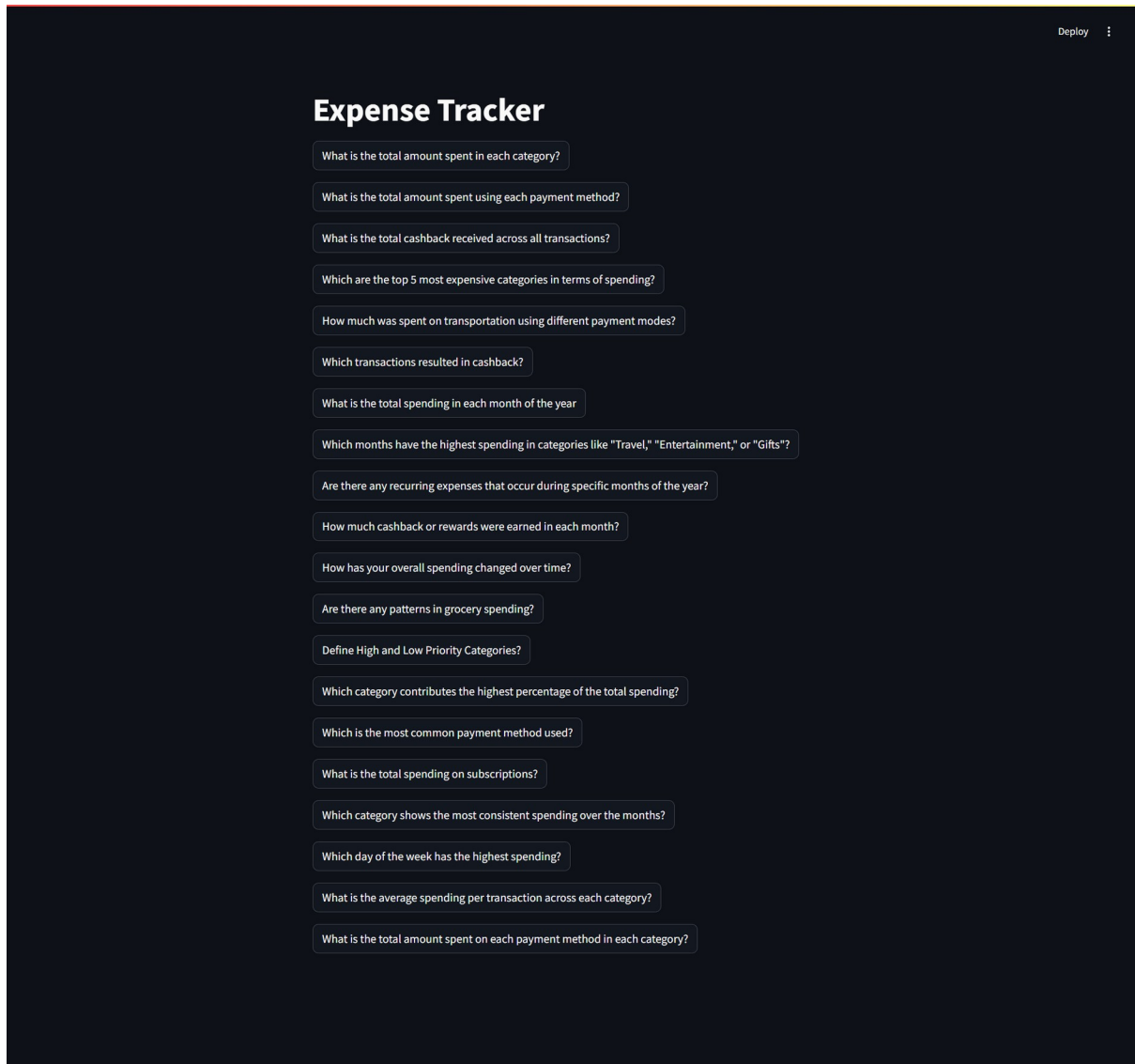
### Step 3: Explore the Insights

The dashboard provides the following insights:

- Overall Spending Trend – A monthly expense overview with total spending.

- **Category-wise Spending – Breakdown of expenses by category.**
- **Payment Methods Analysis – Usage patterns of cash, credit cards, and other payment modes.**
- **Cashback Insights – Identification of transactions eligible for cashback.**  
**Recurring Expenses – Recognition of fixed expenses like rent or subscriptions.**

## 5. Streamlit Web Application Sample Screenshots



What is the total amount spent in each category?

Total Amount Spent in Each Category:

	Category	Total_Amount
1	Subscription	58675.62
2	Investment	60652.24
3	EMI	66120.81
4	Groceries	49183.56
5	Bills	80953.66
6	Transport	41517.94



What is the total amount spent using each payment method?

Total Amount Spent Using Each Payment Method:

	Payment_Mode	Total_Amount
1	Credit Card	115341.02
2	UPI	119305.89
3	Cash	122456.92



Which transactions resulted in cashback?

Transactions resulted in cashback:

	id	Date	Category	Payment_Mode	Description	Amount	Cash
1	1	2025-01-06	Subscription	Credit Card	Subscription for Prime	5337.63	
2	2	2025-01-10	Investment	UPI	Investment in Mutual Funds	4405.42	
3	3	2025-01-10	EMI	Cash	EMI for Chandler-Johnson product	4761.27	
4	4	2025-01-09	Subscription	Credit Card	Subscription for JioHotstar	4197.06	
5	5	2025-01-07	Investment	Credit Card	Investment in Real Estate	9158.74	
6	6	2025-02-04	EMI	Credit Card	EMI for Dunn-Walker product	7708.57	
7	7	2025-02-14	Groceries	UPI	Groceries shopping at Rios LLC	6732.76	
8	8	2025-02-11	Bills	Credit Card	Mobile payment	3683.91	
9	9	2025-02-16	Bills	Cash	Mobile payment	5523.71	
10	10	2025-02-16	Investment	Credit Card	Investment in Mutual Funds	9120.79	

What is the total spending in each month of the year

Total spending in each month of the year:

	Year	Month	Total_Spending
1	2025	1	28741.64
2	2025	2	32657.16
3	2025	3	25354.86
4	2025	4	37029.84
5	2025	5	22514.54
6	2025	6	24666.63
7	2025	7	35379.47
8	2025	8	28741.64
9	2025	9	30466.82
10	2025	10	25915.65
11	2025	11	33747.36
12	2025	12	33747.36

Monthly Spending Trend

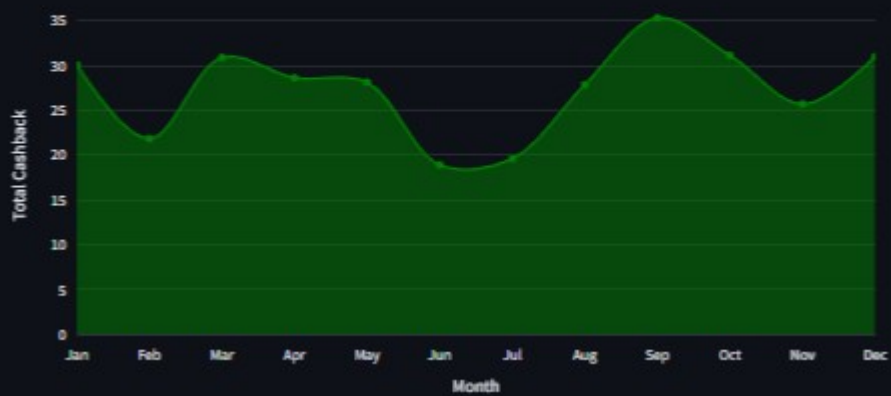


How much cashback or rewards were earned in each month?

Cashback or Rewards earned in each month:

	Year	Month	Total_Cashback
1	2025	1	30.08
2	2025	2	21.85
3	2025	3	30.92
4	2025	4	28.64
5	2025	5	28.15
6	2025	6	18.93
7	2025	7	19.6
8	2025	8	27.86
9	2025	9	35.33
10	2025	10	31.14

Monthly Cashback or Rewards Earned





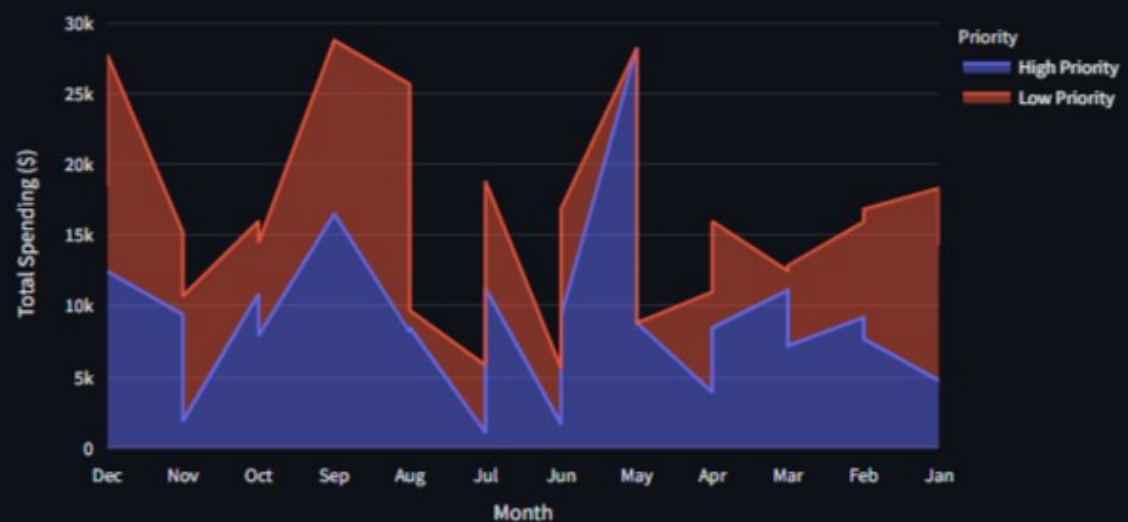




### High and Low priority categories:

	Year	Month	Category	Priority	Total_Spending
1	2025	12	Groceries	Low Priority	6007.19
2	2025	12	Subscription	Low Priority	15282.55
3	2025	12	Transport	High Priority	12457.62
4	2025	11	Bills	High Priority	9437.07
5	2025	11	EMI	High Priority	1889.68
6	2025	11	Groceries	Low Priority	5763.26
7	2025	11	Investment	Low Priority	8825.64
8	2025	10	Bills	High Priority	10885.85
9	2025	10	EMI	High Priority	7922.44
10	2025	10	Investment	Low Priority	5116.72

### High vs. Low Priority Spending Trends



What is the total amount spent on each payment method in each category?

Total amount spent on each payment method in each category:

	Category	Payment_Mode	Total_Spending
1	Bills	UPI	50082.16
2	Bills	Credit Card	15556.41
3	Bills	Cash	15315.09
4	EMI	Cash	41109.67
5	EMI	Credit Card	14001.49
6	EMI	UPI	11009.65
7	Groceries	UPI	29023.87
8	Groceries	Cash	13085.32
9	Groceries	Credit Card	7074.37
10	Investment	Credit Card	38421.33

Spending by Payment Mode Across Categories



## 6. Future Enhancements

**User Authentication:** Secure login to store and track individual user expenses.

**Expense Forecasting:** Predict future expenses using machine learning.

**Budgeting Feature:** Set monthly limits and receive alerts for overspending.

## 7. Conclusion

This project provides a data-driven approach to personal finance management. By using MySQL queries and visual analytics, users can gain meaningful insights into their spending behavior and make informed financial decisions.